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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/599,102

09/19/2006

Shin Nakamura

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EXAMINER

TURNER, KATHERINE ANN

ART UNIT

PAPER NUMBER

4132

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/599,102	<b>Applicant(s)</b> NAKAMURA ET AL.	
	<b>Examiner</b> Katherine Turner	<b>Art Unit</b> 4132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 September 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>09/21/2006</u> .  | 6) <input type="checkbox"/> Other: ____.                          |

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Objections***

2. Claim 13 is objected to because of the following informalities: This is a new claim added by amendment; therefore it needs to be labeled as new. Appropriate correction is required.

### ***Drawings***

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "1390" and "1393" have both been used to designate "single cell structure" (page 11, lines 3 and 4).
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "1388" and "1390" have both been used to designate "evaporation inhibiting layer" (Abstract; page 14, line 17; page 15, lines 9, 13, and 14).
5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "1388" (Abstract; page 14, line 17; page 15, lines 9, 13, and 14).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet

submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1, 3, 4, 7, 10, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Ren et al. (US 2004/0209136).

As to claim 1, Ren teaches a solid electrolyte fuel cell (having a solid membrane electrolyte) ([0024]) comprising:

- layers of a fuel cell (Applicant's laminate) compressed to adhesion by bolts (122) (figures 1-4 and 8; [0045], lines 17-22) of
- a methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) (figures 2-4 and 8; [0048], lines 24-27; [0031]),
- an anode current collector (224, 424, 823) (figures 2-4 and 8; [0049]; [0067]; [0079]),

- a catalyzed membrane electrolyte (204, 404, 804) with an electrocatalyst coating on an anode face (206) (Applicant's anode catalyst layer), a membrane electrolyte (Applicant's solid electrolyte membrane), and an electrocatalyst coating on a cathode face (208) (Applicant's cathode catalyst layer) (figures 2-4 and 8; [0048]),
- a cathode current collector (226, 426, 836) (figures 2-4 and 8; [0049]; [0067]; [0079]),
- and a cathode filter (290, 480, 880) (Applicant's evaporation inhibiting layer) which limits cathode water evaporation rate ([0085], lines 13-18; [0059])
- in sequence (figures 2-4 and 8),
- wherein the cathode filter (290, 480, 880) (Applicant's evaporation inhibiting layer) is made of expanded PTFE ([0082], lines 14-16) which is microporous (applicant's having venting pores) ([0057], lines 4-7; [0059]; claim 24) and covers the surface of the cathode current collector (226, 426, 836) (figures 2-4 and 8).

Regarding claims 3-4, Ren teaches the cathode filter (290, 480, 880) (Applicant's evaporation inhibiting layer) is made of expanded PTFE (Applicant's polytetrafluoroethylene) ([0082], lines 14-16) which is microporous (applicant's porous material) (figures 2-4 and 8; [0057], lines 4-7; [0059]; claim 24).

Regarding claims 7 and 10-11, Ren teaches a fuel reservoir (450, 850) (Applicant's container) reserving a neat methanol (Applicant's liquid fuel) supplied to an

anode side is placed adjacently to the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) (figures 2-4 and 8; [0048], lines 22-27; [0068], lines 1-4).

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. Claims 2 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ren as applied to claim 1 above, and further in view of Peled et al. (WO 03/009410).

As to claim 2, Ren teaches the cathode filter (290, 480, 880) (Applicant's evaporation inhibiting layer) is made of multiple layers of material that limit water vapor escape rate ([0059]; [0082], lines 14-16). Ren is silent to the backing layers being made of a laminated fibrous material.

Peled teaches a liquid-water leak-proof layer consisting of layers of Toray carbon paper laminated together with a paste (page 12, lines 22-29; page 13, lines 1-11). The Toray carbon paper is a fibrous material.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Ren's multiple layers of material with Peled's multiple layers of Toray carbon paper (Applicant's fibrous material) laminated together with paste, because they are equivalents in the art of evaporation inhibiting layers, and because Peled's laminated layers are liquid-water leak-proof layers, as taught by Peled (page 12, lines 22-29; page 13, lines 1-11), and Ren desires the layers to limit water vapor escape ([0059]; [0082], lines 14-16).

Regarding claim 9, Ren teaches a fuel reservoir (450, 850) (Applicant's container) reserving a neat methanol (Applicant's liquid fuel) supplied to an anode side is placed adjacently to the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) (figures 2-4 and 8; [0048], lines 22-27; [0068], lines 1-4).

11. Claims 5-6 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ren as applied to claim 1 above, and further in view of Plowman et al. (US 4,722,773).

As to claims 5-6, Ren teaches the cathode filter (290, 480, 880) (Applicant's evaporation inhibiting layer) is made of expanded PTFE, a hydrophobic material that is porous, these pores cause it to be hydrophilic as well ([0057], lines 4-7; [0059]; [0082], lines 14-16; claim 24). Ren is silent to the cathode filter (290, 480, 880) (Applicant's evaporation inhibiting layer) comprising a punching plate made of a metal material.

Plowman et al. teaches the use of a punching plate made of steel (Applicant's metal material) utilized as a support for a hydrophilic and hydrophobic layer in a fuel cell (column 2, lines 48-61).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Ren's cathode filter (290, 480, 880) (Applicant's evaporation inhibiting layer) to comprise Plowman's punching plate made of steel, because Plowman's punching plate made of steel would be a support for Ren's cathode filter (290, 480, 880) (Applicant's evaporation inhibiting layer), as taught by Plowman (column 2, lines 48-61).

Regarding claims 12-13, Ren teaches a fuel reservoir (450, 850) (Applicant's container) reserving a neat methanol (Applicant's liquid fuel) supplied to an anode side is placed adjacently to the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) (figures 2-4 and 8; [0048], lines 22-27; [0068], lines 1-4).

The "punching plate made of metal material" is a product-by-process claim; the product being a metal plate with voids in it, and the process being punching. "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.



12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ren as applied to claim 7 above, and further in view of Wilson (US 6,808,838).

Ren teaches the fuel reservoir (450, 850) (Applicant's container) reserving a neat methanol (Applicant's liquid fuel) supplied to an anode side is placed adjacently to the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) (figures 2-4 and 8; [0048], lines 22-27; [0068], lines 1-4).

Ren also teaches carbon dioxide (Applicant's a gas generated by a cell reaction) is vented between the anode diffusion layer (210) and the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) by figure 2's arrow (234) (Applicant's gas discharging part which is not adjacent to the fuel-absorbing member for discharging), the carbon dioxide (Applicant's a gas generated by a cell reaction) travels next to the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part). The methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) resists carbon dioxide from flowing back into the fuel chamber, so some of the carbon dioxide flows into (Applicant's in the limited fuel-permeating part) the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part), but is kept from going into the fuel chamber, therefore directing the carbon dioxide back out according to figure 2's arrow (234) (figures 2-4 and 8; [0049], lines 15-18; [0066]).

Ren also teaches a fuel reservoir (450, 850) placed adjacently to the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) (figures 2-4 and 8; [0048], lines 22-27; [0068], lines 1-4).

Ren also teaches the desire to have the liquid methanol in the fuel reservoir (450, 850) to undergo a phase change to methanol vapor prior to introduction to anode (figures 2-4 and 8; [0068]).

Ren is silent as to a fuel-absorbing member being placed adjacently to a part of the methanol delivery film (209, 460, 860) (Applicant's limited fuel-permeating part) that absorbs the liquid fuel.

Wilson teaches a superabsorbent material (36) (Applicant's fuel-absorbing member) being placed within a fuel reservoir cavity (34) (figure 2B; column 6, lines 12-40). Wilson teaches that the superabsorbent material (36) (Applicant's fuel-absorbing member) supplies phase changed methanol from neat liquid to vapor form, which limits methanol cross-over (column 4, lines 57-62).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Wilson's superabsorbent material (36) (Applicant's fuel-absorbing member) to Ren's fuel reservoir (450, 850), because the superabsorbent material (36) (Applicant's fuel-absorbing member) supplies phase changed methanol, from neat liquid to vapor form, which limits methanol cross-over, as taught by Wilson (column 4, lines 57-62), and desired by Ren (figures 2-4 and 8; [0068]).

#### ***Correspondence/Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine Turner whose telephone number is (571)270-5314. The examiner can normally be reached on Monday through Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jessica Ward can be reached on (571)272-1223. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. T./  
Examiner, Art Unit 4132

/Jessica L. Ward/  
Supervisory Patent Examiner, Art Unit 4132